Compact Transcranial Doppler (TCD) for Bioastronautics Research, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

Returning men to the Moon and manned Mars missions will require advanced bioastronautics research. One possible risk is Decompression Sickness (DCS) resulting from extravehicular activity (EVA), after exposure to habitat conditions that would be generated using available Moon or Martian resources. A key research tool to measure the onset of DCS is a Transcranial Doppler (TCD) instrument. The present research tool is bulky and does not allow for measurement of the TDC signal under astronaut stress conditions including exercise, EVA, pre-breathing prior to EVA, and work. GeneXpress Informatics, Ten X Technology and UTHSC-SA proposes to develop a fully functional TCD research device for hypobaric experiments for determining DCS risk assessment and management. GXI has develop a unique auto-focusing and steering TDC system which allows for the real time monitoring of DCS parameters during hypobaric stress activity experiments. In this Phase II program, the team proposes to (1) Define and Determine test bed requirements, (2) Identify and procure TCD components, (3) Design & Assemble the Piezoelectric Transducer, (3) Design & assemble Transducer attachment method, (4) Design, Assemble & Test Portable Instrument Electronics, (5) Develop Software for the Instrument and Development Platform, (5) Evaluate Laboratory Test Bed, and (6) Construct System Deliverable.

Primary U.S. Work Locations and Key Partners

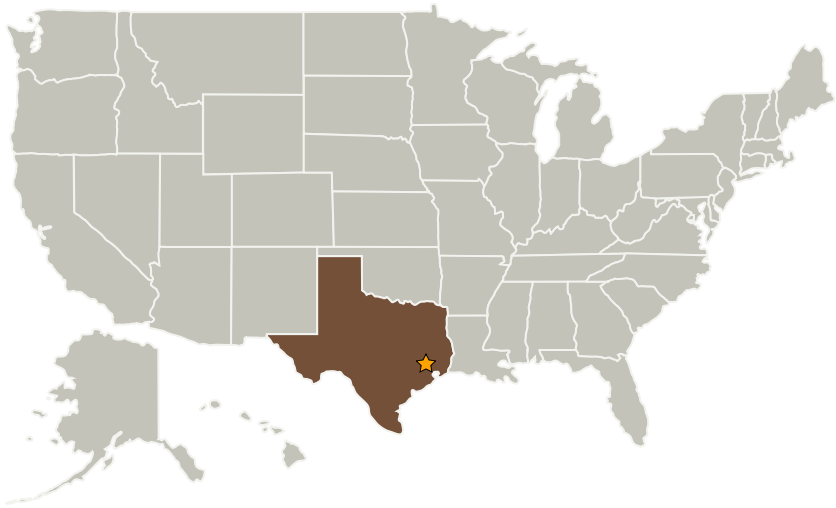

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Genexpress Informatics, Inc.	Supporting Organization	Industry	Austin, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.4 Decompression Sickness Mitigation